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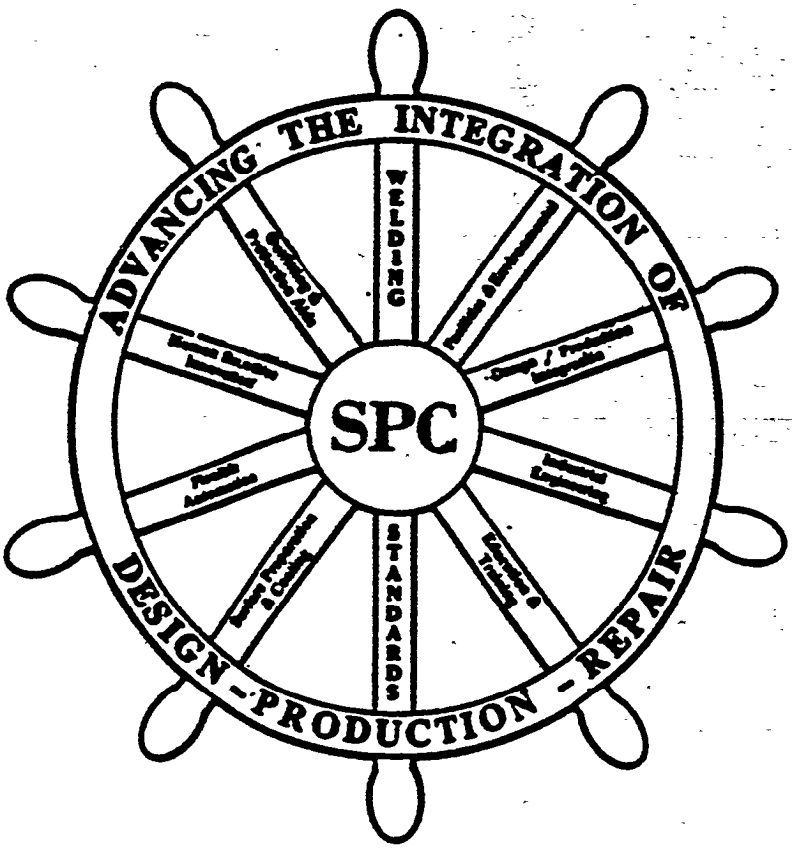


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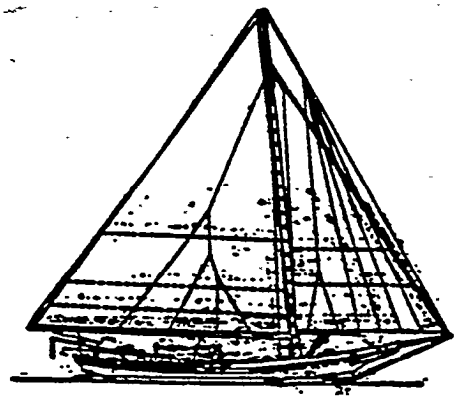

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# Management Development for the Shipbuilding Industry

No. 7A

John A. McCarthy, Visitor, and Jeffrey S. Geiger, Member, Bath iron Works Corp., Bath, ME

ABSTRACT

The current condition of the U.S. shipbuilding industry makes it vitally important for shipyards to develop company-trained managers with both business and shipbuilding management skills. In order to meet this need, the Bath Iron Works Corporation established the Management Development Program in April of 1986. BIW specifically recognized the need to develop middle managers with broad company backgrounds. The program was created to provide the company with a group of high-potential shipyard managers with sound general management skills.

This paper will address the evolution of the Management Development Program at Bath Iron Works. from the initial identification of the need for the program through the completion of the program by the first class of Management Development "interns". The paper will also include an analysis of the original program design and a discussion concerning the current status of the program. Based upon experience gained through the initial implementation of the program, some improvements are being made in the organization and general structure of the program. We will examine lessons learned, the future of the Management Development Program at BIW. and career development within the industry as a whole.

## INTRODUCTION

The Management Development Program was initiated at Bath Iron Works by senior management in an effort to bolster the number of effective middle managers within the shipyard. The company's top executives identified the need for middle managers to understand all of the critical functions which make up the shipbuilding process. As in many companies with traditional functional organizations, the tendency to become specialized in a particular functional area existed within the shipyard. Managers understood their own department, but their knowledge of the relationship between departments was limited. In order to develop middle managers with a detailed understanding of the entire shipbuilding process, BIW devoted the necessary resources to establish a Management Development Program.

The purpose of the program was to establish a talent pool of potential managers for the future leadership of Bath Iron Works by providing participants the opportunity to develop knowledge of the shipbuilding manufacturing process as well as general management skills (1). In order to implement a program of this magnitude, dedicated senior management commitment was essential. William E. Haggett, Chairman and CEO of Bath Iron Works, was. and still is, one of the leading proponents of the Management Development Program. In addition to Hr. Haggett, many other top executives in the company are strong supporters of the program. This unwavering commitment from top management laid a solid foundation upon which the program was built.

## CAREER DEVELOPMENT

Recent research studies concentrating on management development have surfaced interesting and helpful findings. The Honeywell Corporation commissioned its corporate training group to investigate ways to improve the management development function. One of the findings of this research was a comparison of the relative importance of job experiences, relationships, and education to development. A weighting of 50% - 30% - 20%. respectively, was obtained (2). Drawing from this data, it was concluded that most development occurs outside of formal training. Therefore. to have more impact on

development. training must target activities that support the development which occurs as a result of job experiences and relationships (2). Experience is the best teacher. but it must be realized that for effective development. the experiences must be planned.

Experiences provide development through enhancing existing skills **or** developing new skills, providing broader perspectives and visibility. and improving confidence. Job experiences play a key role in new skill development, especially when it involves people making cross functional moves. Moving across functional areas exposes an individual to a variety of problems, forcing new skill development to be effective. Participation in tough projects can also provide a significant development job experience.

In addition to experiences, people develop through job relationships by increasing their effectiveness, learning new skills, learning corporate values, and shaping their management style. Building a network of relationships can increase effectiveness by establishing people who can act as advocates, assist in getting promotions **or** job changes. and share in the joys of success (2). The development of this network can be expedited by aligning an individual with a mentor or, coach. Building a relationship with a mentor **or** coach can enhance the development process of rising managers by providing a:

Role model
Sounding board
Broader perspective
Skill builder
Sponsor, motivator, and confidence builder

Another component of development is education, of which the primary purpose is to transfer relevant skills. Improving communication skills and business knowledge are two of the most beneficial areas. Training also helps participants develop contacts and learn from others. Not to be underestimated is the role of education in broadening perspectives and challenging thinking. Through the learning process, solving problems outside of one's usual mode of thinking forces people to approach problems differently (2).

In a more detailed manner, a General Electric study explored the development process of technical leaders. GE defines a technical leader as an individual who combines technical expertise with the leadership skills required to move an organization in a direction he or she identifies (3). Through their research, GE identified a set of career building blocks that top leaders had completed in developing their technical leadership skills. These building blocks included:

Participation in essential experiences

Assumption of key roles

Progressive training in a defined set of knowledge and skills.

While there is no single career path or sequence, the above building blocks were completed within some fairly specific timeframes. These timeframes were:

Formative First 5 years after beginning first post-Bachelor's Degree job

Maturing - Next 10 years

Broadening - 16 plus years.

By combining the building blocks with the defined career stages. GE developed a career development road map. (See Table 1.) The building blocks can be completed in separate assignments or often within a single assignment (3). From their research, almost every high-level technical leader had completed virtually all the essential experiences with each stage. The experiences provided opportunities for on-the-job development in the technical/business environment which were vital for developing leadership skills (3).

Bath Iron Works Corporation recognized the need for a program combining job experiences, academic education, skill development, and relationship-building in its design of BIW'S Management Development Program. The remainder of this paper will describe the design, implementation, and future plans of the BIW program.

PROGRAM DESIGN

BIW senior management directed the establishment of a Management Development Steering Committee in early 1986, whose ***role*** was to develop the structure of the program and participate in the recruiting and selection of qualified applicants. This Steering Committee was comprised of high-level managers from Engineering. Human Resources, Production.

| STAGE | ESSENTIAL EXPERIENCES | KEY ROLES | TRAINING FOCUS |
|---|---|---|---|
| FORMATIVE (BY 5 YEARS) | . UNIQUE TECHNICAL SUCCESS<br>. STRETCH JOB ASSIGNMENT<br>. SUBSTANTIVE LEAD SUCCESS<br>. BROAD BUSINESS EXPOSURE<br>. SIGNIFICANT ROLE MODELS | • TECHNICAL CONTRIBUTOR<br>. TEAM LEADER<br>. PROJECT LEADER | . FUNCTIONAL ORGANIZATION<br>. TECHNICAL COMPETENCE<br>. BASIC INFLUENCE SKILLS<br>. CHANGE MANAGEMENT<br>. CAREER MANAGEMENT<br>. PROJECT MANAGEMENT |
| MATURING (BY 15 YEARS) | . BROAD BUSINESS INVOLVEMENT<br>. SELF IMAGE AS A LEADER<br>. DEVELOPMENT OF A LEADERSHIP NETWORK | . TEAM LEADER<br>. PROJECT LEADER<br>. PROGRAM LEADER | • INTERFUNCTION RELATIONSHIPS<br>• FUNCTIONAL STRATEGIES<br>• STRATEGIC INFLUENCE SKILLS<br>• RESOURCE MANAGEMENT<br>• COMPETITIVE ADVANTAGE<br>• CUSTOMER SERVICE<br>• PROGRAM MANAGEMENT<br>• TECHNOLOGY IMPLEMENTATION |
| BROADENING (16+ YEARS) | . HIGH BUSINESS IMPACT ASSIGNMENT<br>. TOTAL RESPONSIBILTY ASSIGNMENT<br>. EXPANDED EXTERNAL NETWORK | . PROJECT LEADER<br>. PROGRAM LEADER<br>. FUNCTIONAL LEADER | . FUNCTIONAL/OPERATIONS MANAGEMENT<br>. BUSINESS STRATEGIES VISIONING<br>. ORGANIZATION STRUCTURING AND CHANGE |

Table 1: General Electric's Career Development Roadmap (Adapted from a Figure in "Developing Technical Leaders. Building Blocks for Success in Engineering and Manufacturing."Schoonover and Weiler, July 1987)

Systems, and Finance. including several members at the vice presidential level. The Committee faced several difficult decisions in designing the structure of the program, such as: How long will the program be? How many participants will be included in each year of the program? Where will the participants for the program be recruited? What are the qualifications needed for consideration for the program? These are only a few of the many critical questions that needed to be resolved to successfully implement the Management Development Program.

After months of deliberation and several meetings of the Steering Committee, the initial structure of the program emerged. The Committee created a 2-year program which included a series of work rotations through major functional departments, academic course work, management skills seminars, and weekly staff meetings.

The work rotations were structured in general terms in order to give the interns a degree of flexibility in setting up their work schedule. Table 2 shows the required functional areas and the duration of each rotation in months.

| FUNCTIONAL AREA | DURATION |
|---|---|
| ENGINEERING | 6 MO. |
| PRODUCTION | 6 MO. |
| PLANNING | 6 MO. |
| OPTION TIME | 6 MO. |
| TOTAL | 24 MO. |

Table 2: Work Rotation Breakdown

As the exhibit suggests. an intern is allowed 6 months of "option time" in addition to the required time spent in Engineering, Production, and Planning. This option time can be spent in any area within the shipyard which interests the intern (e.g., Contracts, Program Office, and Labor Relations), divided into 1-, 2-, or 3-month increments. In addition to

the departmental rotations, interns are required to successfully complete selective graduate level business courses. If an intern fails one of the required courses, he/she can be dropped from the program. Along with the course work, interns are required to attend numerous management skills seminars and workshops, concentrating on topics such as project management. presentation skills, statistical process control, ship production, contracts, and management skills.

The program was designed to accommodate ten participants in each year of the program, the first year having ten interns and a second class of ten interns being' introduced in the second year. After the first year. the program would support 20 interns a year on a rotating basis, with a new class of 10 participants replacing the graduating class at the completion of the 2-year program. Organizationally, interns are considered employees of the Training Department for the duration of the program. reporting directly to the Manager of Employee Development. Interns' yearly evaluations of work performance are also administered through the Training Department by synthesizing evaluations from supervisors in each work rotation. At the completion of each rotation, the intern is evaluated by his/her supervisor. This provides the intern formal written feedback on performance 2 to 4 times per year.

REQUIREMENTS

Candidates for the Management Development Program are selected from current BIW employees and college graduates each spring. Minimum requirements of applicants for the program are a 4-year college degree *or* graduation from BIW's Shipbuilding Apprentice **Program.** The selection criteria for candidates includes the following components:

- Leadership
- Communication skills
- Achievements/accomplishments
- Maturity.

Applicants **are** evaluated on the relative strength of these characteristics through a two-step interviewing process. Initial interviews are conducted on college campuses during February and March of each year. First interviews of current BIW employees **take** place in June of each **year.** A series of second interviews, conducted by vice presidents, is held for selected individuals on-site at BIW. Offers of employment in the Management Development Program are issued subsequent to the results of the second interviews.

PROGRAM IMPLEMENTATION

The BIW Management Development Program began in September of 1986 for the first class of interns. The class was made up of individuals with varied backgrounds. including engineers, liberal arts majors. and current BIW employees with significant production experience. The diversity of the group helped to integrate the members of the first class. The experienced BIW employees acclimated the new employees in the class to the culture and norms of the shipyard. Based upon experience gained through the initial implementation of the program. some improvements are being made in the organization and general structure of the program. One change in the structure of the program involves the work rotations. Originally, the program was divided into three L-month increments in major functional areas and 6 months of option time. (See Table 2. ) Due to a reorganization within the company and some recommendations from senior management and the program manager, the work rotations were revised. The current work rotation structure is shown in Table 3.

| FUNCTIONAL AREA | DURATION |
|---|---|
| PRODUCTION | 9 MO. |
| ENGINEERING | 4 MO. |
| FINANCE | 3 MO. |
| MATERIALS | 3 MO. |
| OPTION TIME | 5 MO. |
| TOTAL | 24 MO. |

Table 3: Revised Work Rotation Breakdown

The work rotations are the primary learning tool for each intern. Not only do the rotations provide an intern with detailed knowledge of the area and how the area relates to other departments in the shipyard. but also give him/her valuable exposure to key personnel in the company. Typical tasks that are given to Management Development interns include:

Developing shipyard schedules

Working as a production coordinator

Negotiating subcontracts

Documenting work practices

Preparing manning plans for a department

Supervising CAD/CAM operators.

At the end of each work rotation, interns receive written evaluations from their direct supervisor in the functional area. Interns are encouraged to discuss the evaluations with their supervisor to give personal comments or entertain further discussion about the department. If an intern receives unsatisfactory evaluations in more than one department, he/she could be dropped from the program pending review by the Manager of Employee Development. In addition, interns are required to write reports for the Manager of Employee Development on each functional area, summarizing their experience in the department. In addition to work rotations, interns are required to successfully complete graduate level academic courses, which are taught on-site at the BIW Training facility by business schools (University of southern Maine. Northeastern University). The curriculum for the 2-year program includes the fOllOWing courses:

Financial Management
Operations Management
Organizational Behavior
Marketing
Management of Technology.

Although the majority of each class is comprised of Management Development interns, additional company managers are also involved in the classes. These current BIW managers give the interns an additional perspective by relating the course work in the classes to shipyard problems and issues. Course work in each class is graded, and failure of any class could be grounds for termination from the program.

The third integral component of the program concerns supplemental workshops and seminars in managerial topics. Workshops are conducted on-site on a variety *of* topics:

Presentation Skills
Effective Management
Interviewing Skills
Blueprint Reading
Statistical Process Control
Ship Production Technology.

Some of these workshops are taught by BIW personnel while others are instructed by outside consultants. The majority of the seminars are not exclusive to the interns but are conducted for company management throughout the shipyard. This gives the interns an opportunity to interface with company managers and facilitates a good discussion On important company issues. Each intern is also expected to attend at least one off-site seminar a year on a managerial topic of particular interest to the individual. The intent is to increase knowledge of general business functions. develop communication skills, and nurture leadership. Seminars have been attended on topics such as Project Management and Team-Building Skills, Problem Solving and Decision Making, Just-in-Time Manufacturing, and Operations Management.

Another important component of the program is the weekly staff meetings held by the program manager for the interns. These meetings perform a number of functions. They help provide a group identity and a supportive atmosphere. They also serve as a time for exchanging information, from current events company-wide to providing interesting developments in particular departments. On a frequent basis. the meeting serves as an opportunity to invite an upper level manager to share information from his/her perspective and allow the interns to question the manager on his/her management style, philosophies, and daily functions. Lastly, the staff meetings also function as an educational session. with the program manager leading a session in topics such as communication skill development or techniques of managing group meetings.

One of the greatest concerns *of* the architects of the BIW Management Development Program was how the different elements (production workers. middle management, senior management) within the shipyard would react to the implementation of the program. Overall shipyard acceptance was positive in the first year of the program and has improved to the point where the Management Development Program has earned a highly respectable reputation throughout the yard. Production worker acceptance was seen as a possible barrier to implementation; however, the production workforce has accepted the interns and enjoys exchanging viewpoints with future company managers. In most cases, employees are eager to explain their job function and responsibilities to an intern. This relatively rapid acceptance of the program by production workers is due, in part, to the fact that three of the interns in the first class were selected from Production. In terms of middle management support. middle managers

were eager to have an intern rotate through their functional area. However, some managers were ill-prepared to assign tasks and responsibilities to an intern in the embryonic stages of the program. For the most part, this problem has been resolved through a year and a half of experience and greater understanding of the objectives of the Management Development Program and capabilities of an intern. In fact, in many cases, middle managers are requesting the services of an intern for a period of time. This exemplifies the fact that middle managers are realizing that having an intern in their area is an opportunity not only for the intern, but for the manager as well. As for senior management, the support for the program emanating from top executives has been nothing but outstanding from day one. Senior management is strongly committed to the ideals of the program and is encouraged by the quality of the people in the program. Interns meet with senior executives, at least quarterly, to discuss the status of the shipyard and other important issues. This explicit support reinforces senior management's commitment to the program as the building block of the future leadership of Bath Iron Works.

PROGRAM STATUS

The company quickly absorbed the graduating interns into a variety of positions. Interns found positions ranging from supervisory roles to upper level staff positions. Table 4 shows a sampling of the positions accepted. The interest of the different divisions in acquiring an intern was strong, reflecting the success of the program.

| POSITION |
|---|
| • MANAGER OF CRUISER DESIGN |
| . SUPERVISOR OF PRODUCTION ENGINEERING |
| . SUPERVISOR OF MRP PROJECT |
| . PRODUCTION ENGINEER |
| . PLANNING SUPERVISOR |

Table 4: Positions Accepted by Graduating Interns

At the time of this writing, the third class of interns is being recruited. The program is continuing at a level of ten participants per year with a greater majority coming as new hires to the company.

PROGRAM COSTS

As previously mentioned. the implementation of a Management Development Program is an investment in the future of the company. This investment can be segregated into three major elements of cost:

Overhead time
Academic courses
On-site and off-site seminars.

Overhead time refers to the time spent by interns in courses and seminars, staff meetings. and benefits such as sick leave, vacation time, and insurance coverage. The overhead cost element accounts for roughly half of the annual budget for the program.

The other half of the program budget is spent on education and training. coming in the form of academic courses and seminars. Two or three academic courses are taught on-site at BIW each year by an accredited business school. Courses of this type range in cost from $12,000 to $25,000 per course for the existing curriculum. The current design of the program also calls for two or three seminars a year. taught on-site by an outside consultant. On-site seminars typically cost between $3,000 and $10.000 per seminar. Off-site seminars are also included in the annual training budget and are arranged at the intern'S request. These seminars cost up to $2,000 per individual.

FUTURE PLANS

As the first class of management interns completes the 2-year development program, changes are being incorporated to reflect lessons learned thus far. While both company management and program participants acknowledge the program as highly successful, they also wish to build upon past experiences and plan for the future.

One of the changes to the program was a redistribution of time spent and departments visited during the 2 years as mentioned earlier. This was brought about by a recognition of the integral role these functional areas play in the operation of the shipyard. Also. as a part of a company reorganization, the planning rotation was combined with the production assignment.

Another need which was identified was the requirement for a structured placement process for the interns completing the program. For the good of both the company and the interns,

guidelines describing when interns are available for hire, appropriate jobs for interns. and what the interns' commitments are to the program until its completion were developed. Starting in the last 3 to 4 months of the program, interns and departments will begin discussions for permanent jobs. Permanent jobs should be at an appropriate level of responsibility and compensation. Each intern must remain in the program for a full 2 years even if they begin their permanent job prior to the end of the program. By remaining in the program, interns must continue with course work, staff meetings, and other workshops and seminars. In exceptional circumstances, where a particularly appropriate permanent job becomes available prior to the last 3 or 4 months of the program, consideration will be given to early placement. However, in these cases, the intern will still remain in the program until completion.

It was also recognized that some rather simple changes could be made to the logistics of the program to address the needs of the supervising managers of interns in their work rotations. Having a management intern in their group represented a new management challenge to these supervisors. For example, the interns often have additional requirements on their time, such as staff meetings, academic courses, and skill workshops. This situation was resulting in frustration on the part of some supervisors since they felt that they did not know when they could depend on the intern's support and presence. By combining several of these activities on one day of the week, it has helped to structure the intern's schedule, making it easier for the supervisor. This example exhibits the need to emphasize, at the start of such a program, that time must be spent educating and communicating with company managers the objectives and expectations of the program.

The administration of the Management Development Program is appropriately controlled by the Training Department. Unfortunately, this has started to foster an attitude that this is the Training Department's and interns' program, rather than building functional ownership. To address this issue, BIW is considering the formation of a committee which will help "champion" the program in the different functional departments. The make-up of this group and its mission would be decidedly different than that of the initial Steering Committee. This committee would consist of strong middle managers who are concerned with their department's involvement in the workings of the program. They will help drive other department managers to develop appropriate assignments for visiting interns, ensure that interns receive the proper exposure, and serve as a concerned point of contact for the program's manager.

BIW has also identified areas to address in its continuing plans for career development. Naturally, with the company's investment in these individuals, BIW wants to ensure an acceptable retention level. By addressing issues and setting policy to cover areas such as leave of absence for continuing education, the company will support the needs of the interns and other employees. Also, as a result of this program, a more formal program of career pathing may be required for both graduated interns and other rising employees.

## CONCLUSION

In less than 2 years of existence at BIW, the Management Development Program has proven to be a sound investment in the future of the company. BIW has implemented a program which emphasizes the three components of management development outlined in recent studies: job experiences, relationships, and training. The program combines work rotations. academic instruction. and skill development to develop capable people into high potential managers. The success of the program is evident by the intense interest displayed by different functional areas in obtaining an intern. The key to the continued success of the program lies in the ability to sustain this interest. In order to do this, senior management involvement and commitment must remain strong and middle management should continue to play a key role in the ownership of the program.

The need for strong management in the shipbuilding industry has never been greater. The intensely competitive environment in both the commercial and naval markets requires management with exceptional skills in a variety of areas. To be successful requires creative approaches to engineering, planning, and construction process technologies. Management systems that have effective cost and schedule controls must be employed. This requires leaders proficient in the technical requirements of the shipbuilding process in addition to strong leadership, motivational, and communication skills. The necessary

improvements for a viable long term shipbuilding industry in this country will not result from governmental policies, but will be a result of effective shipyard management. The development of personnel must become a priority for this industry to aggressively overcome the challenge of the present and the future.

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